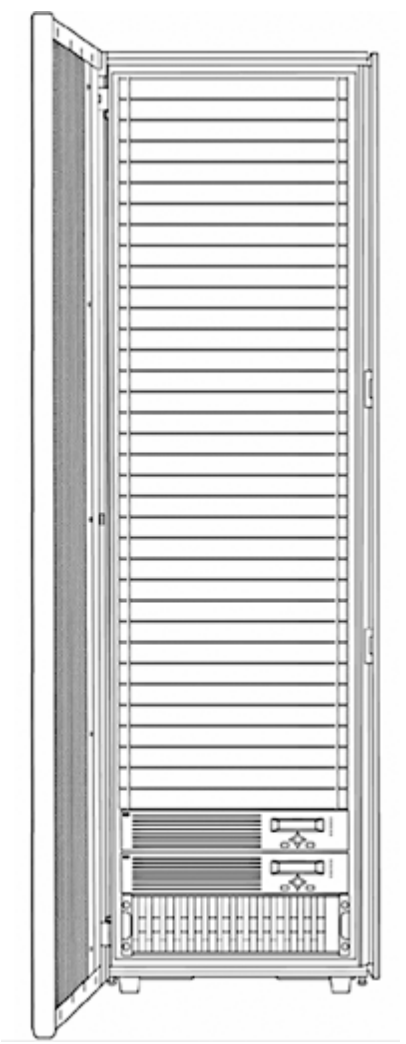
Overview

The HP StorageWorks Enterprise Virtual Array family is the next generation of storage array products. Designed specifically for customers in the business critical, enterprise marketplace offering a high performance, high availability "virtual" array storage solution. Not only does this solution save time, space and costs compared to traditionally architected storage, it is supported by a powerfully simple suite of management software making it easy for users to achieve highest level of productivity.

The Enterprise Virtual Arrays are designed for the data center where there is a critical need for improved storage utilization and scalability. They meet application specific demands for transaction I/O performance for mid-range and enterprise customers. They provide easy capacity expansion, instantaneous replication, and simplified storage administration. The Enterprise Virtual Arrays combined with HP StorageWorks Command View EVA software provides a comprehensive solution designed to simplify management and maximize performance.

HP offers a full spectrum of complimentary HP StorageWorks EVA hardware, software product, solutions and HP services. This ranges from EVA iSCSI Connectivity Option, Business Copy EVA, Continuous Access EVA and solution integration. In addition, the EVA warranty offering -- Foundation Service Solution, provides the base level of service included with the EVA. HP Services provide additional offerings up to Critical Service, the support for mission critical environments.



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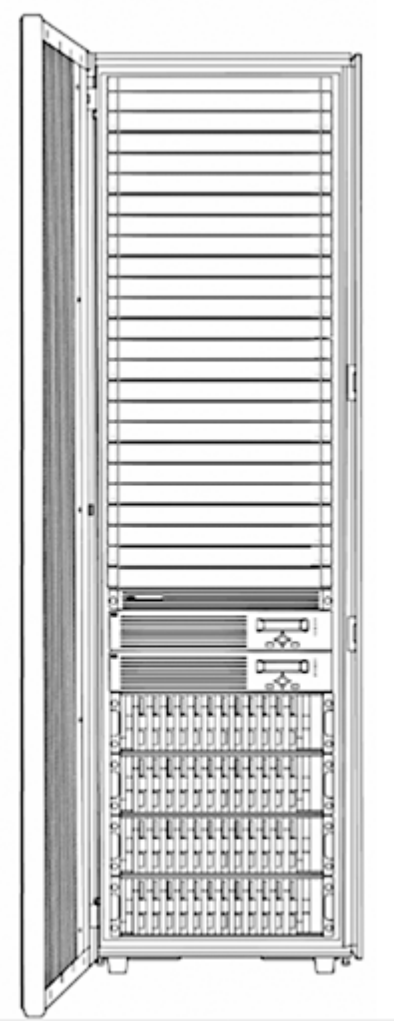

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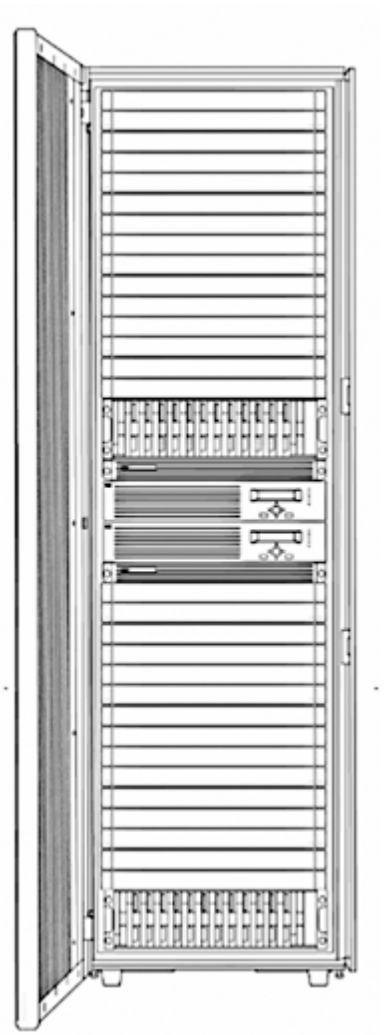

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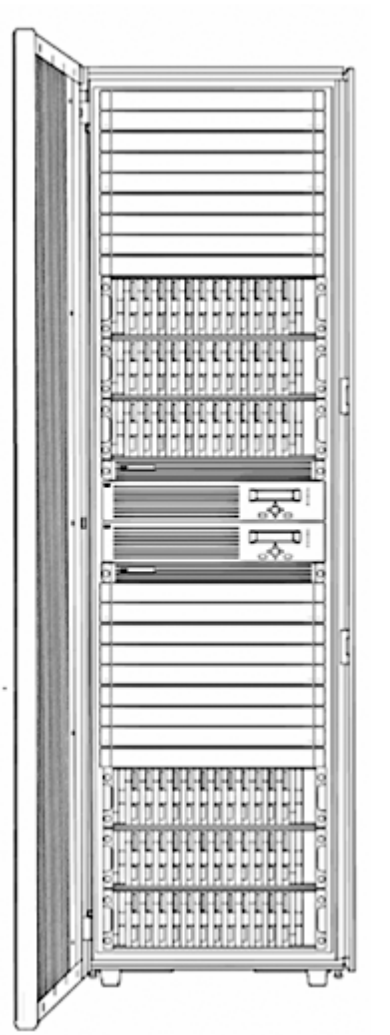

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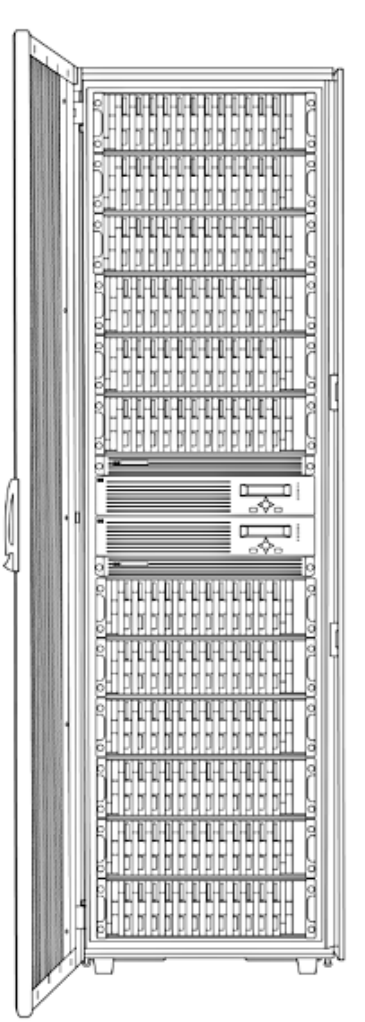

EVA8000 2C12D

What's New

Overview

The new EVA Arrays:

- EVA4000 2C1D Array is capable of 4Gb host connectivity, with a pair of HSV200 controllers, one M5314B disk drive enclosure, mounting hardware and cables for factory configure to order utilizing the new HP 10000 G2 Series Rack
- EVA6000 2C4D Array is capable of 4Gb host connectivity, with a pair of HSV200 controllers, four M5314B disk drive enclosures, two FC loop switches, mounting hardware and cables for factory configure to order utilizing the new HP 10000 G2 Series Rack
- EVA8000 is capable of 4Gb host connectivity and offers three base models: 2C2D, 2C6D and 2C12D. Each model comes installed in a 42U graphite cabinet, with a pair of HSV210 controllers, 2, 6 or 12 M5314B disk drive enclosures (depending on the model), a set of four FC-AL switches (in 2C6D and 2C12D models, and optional for 2C2D model), mounting hardware and cables.
- HP StorageWorks EVA4000/6000/8000 v5.1 controller media kit (XCS v5.1)
- Support for industry popular multi-pathing software solutions
- Support for integrated EVA iSCSI Connectivity Option
- Support for 4Gb host bus adapters and switches
- Business Copy EVA enhancements - Oracle Integration, RSM user enhancement and support for 16 snapshots
- Continuous Access EVA enhancements - Improved distance asynchronous support
- HP Systems Insight Manager included with EVA4000/EVA6000/EVA8000

Product Highlights

	EVA4000	EVA6000	EVA8000
Application Environment	Entry	Mid/High	Business Critical
Local Data Replication -- HP StorageWorks Business Copy EVA	yes	yes	yes
Remote Data Replication -- HP StorageWorks Continuous Access EVA	yes	yes	yes
Easy array management and configuration -- HP StorageWorks Command View EVA	up to 16 EVAs	up to 16 EVAs	up to 16 EVAs
RAID supported	Vraid1, Vraid 0+1, Vraid5, Cross Vraid	Vraid1, Vraid 0+1, Vraid5, Cross Vraid	Vraid1, Vraid 0+1, Vraid5, Cross Vraid
Cache (per controller pair)	4GB	4GB	8GB
Host Ports, (per controller pair)	4	4	8
Host Port Speed	2 or 4 Gb	2 or 4 Gb	2 or 4 Gb
Device Ports, (per controller pair)	4	4	8
Back-end switch (per array)	0	2	4
Device shelves	1 to 4	4 to 8	2 to 18
Drives per enclosure	14	14	14
Drive types (mixed in enclosure)	High Performance Fibre Channel and Fibre Attached Technology Adapted (FATA)	High Performance Fibre Channel and Fibre Attached Technology Adapted (FATA)	High Performance Fibre Channel and Fibre Attached Technology Adapted (FATA)
Supported disks, min-max	8 to 56	16 to 112	8 to 168 (one cabinet) up to 240 with utility cabinet
Capacity	.5 to 28TB	1.2 to 56TB	.5 to 120TB
I/O Requests per Second (IOPs)	141,000	141,000	>200,000
Maximum throughput (MB/s)**	335	650	1500

EVA Capabilities

- Support for dual-ported 2 Gb/s FC disk drives and dual-ported Fibre Attached Technology Adapted (FATA) drives
- Support for Direct Attach connection to Windows servers without the need for SAN switches.
- Support for integrated EVA iSCSI Connectivity Option direct for Windows and Linux or through the SAN
- Management of up to 1024 virtual disks (256 per HBA) ranging in size from 1 GB to 2 TB per Virtual disk, in 1GB increments.
- Dynamic capacity expansion (in 1 GB increments).
  NOTE: Requires Host Operating System Support.
- Virtual disk data load leveling (non-disruptive background activity)
- Distributed sparing of disk capacity.
- Support for HP StorageWorks Continuous Access EVA remote replication (synchronous and asynchronous).
- Support for HP StorageWorks Business Copy EVA (Snapshot, and Vsnap, Snapclone and Cross Vraid snapshots and Snapclone).
- Dual redundant controller operation for increased fault tolerance.
- Multiple Bus Failover Support using industry popular multiple path software. NOTE: Requires native OS multi-pathing support
- Battery-Back-Up for controller cache memory
- Asynchronous Disk Swap (hot swap)
- Clustered Server Support
- Mirrored Write-Back Cache Support
- Read-Ahead and Adaptive Read Caching Support
- Virtual RAID Arrays (Vraid0, Vraid1, Vraid5, Vraid 0+1)

- Support for local replication between Vraid types using Vsnap or Snapclone within a disk group or using Snapclone across disk groups (and Cross Vraid Snapshot and Snapclone)
- Non-disruptive XCS software upgrade capability
- Supports connection of up to 256 hosts
- Multi-Vendor Platform Support
- Controller Password Protection for Configuration Control
- Selective Storage Presentation and SAN-based Data Zoning (through switches).
- HP StorageWorks Command View EVA GUI Interface for management and monitoring (manages up to 16 EVAs).

Enterprise Virtual Array Product Packaging

The EVA4000 packaging consists of a 4U FC dual HSV200 controller assembly and 14-bay Model M5314B FC Drive Enclosures. The EVA4000 is designed to address moderate capacity needs ranging (from 0.57 - 28 TB) as well as high performance options in commercial environments.

The EVA6000 packaging consists of a 4U FC dual HSV200 controller assembly and four 14-bay Model M5314B FC Drive Enclosures. The EVA6000 is designed to address moderate capacity needs ranging (from 1.15 - 56 TB) as well as high performance options in commercial environments.

The EVA4000 and EVA6000 configurations allow a wide range of configuration options. The bundled models offer flexible factory rack-mounting options in either a standard 42U cabinet (based on the HP 10000 G2 Series Rack- or a choice of 42U extended and 36U heights). The new factory racking options allow the EVA4000 and EVA6000 to be factory integrated into cabinets with a wide variety of other HP offerings such as servers and tape back-up offerings.

The EVA4000/6000 are also available as a Controller Pair Assembly, individual M5314B Drive Enclosures, and Optional FC Dual Loop Switches to accommodate adding EVA4000/6000 subsystems to existing EVA configurations, other supported HP field racking choices and to support qualifying customer-supplied racks. The Rack System/E cabinets (choice of 41U, 33U and 25U heights) and 5642 (42U) Rack Cabinet System are supported for field installation.

The EVA8000 packaging consists of a 4U FC dual HSV210 controller assembly, 14-bay HP StorageWorks Model M5314B FC Drive Enclosures, four FC Loop Switches (optional for 2C2D model, standard for 2C6D and 2C12D models) packaged in a 42U HP 10000 G2 Series Rack. The EVA8000 is designed to address moderate to large capacity needs ranging (from 2 - 18 drive enclosures, 0.56 - 120TB) as well as high performance options in commercial environments.

The EVA8000 is also available as a Controller Pair Assembly, individual M5314B Drive Enclosures, and Optional FC Dual Loop Switches to accommodate adding EVA8000 subsystems to existing EVA configurations, other supported HP field racking choices and to supported qualifying customer-supplied racks. The Rack System/E cabinets (choice of 41U, 33U and 25U heights) and 5642 (42U) Rack Cabinet System are supported for field installation.

Multi-Vendor Platform

The EVA4000/EVA6000/EVA8000 provide support for industry-leading Operating System platforms including: HP-UX, HP OpenVMS, HP Tru64 UNIX, Windows 2000 Server & Advanced Server, Windows 2003 Standard/Enterprise (32/64-bit) and Extended(32/64-bit), /DataCenter (64-bit), Sun Solaris, Linux, IBM AIX, Novell NetWare and VMware.
NOTE: See Operating System, Cluster and High Availability Compatibility matrix above for Operating System version detail.

Designed for No-Single-Point-of-Failure

The EVA family's redundant architecture and value added software is designed to eliminate single-points-of-failure from server to storage in clustered or single server configurations with multi-pathing.

Product Highlights

Disaster Tolerant Replication (Software option)

HP StorageWorks Continuous Access provides disaster tolerant replication across a Fibre Channel SAN. Continuous Access EVA performs real-time replication between HP StorageWorks Enterprise Virtual Arrays. Continuous Access EVA provides the highest level of FC SAN data protection to customers in order to meet disaster tolerant business continuity implementation goals. Through the use of MAN/WAN Fibre Channel SAN extensions, Continuous Access EVA provides 24x7 protections against disaster like scenarios, in campus, metro or continental networks. Thus, enabling business protection against unforeseen events.

HP StorageWorks Disaster Tolerant Solution for mySAP Business Suite on EVA offers a business continuance solution for SAP environments, where data integrity and value added functionality are high priorities. Best practices for implementing remote mirroring of an SAP database as part of an overall data protection strategy with SAP applications can be found at:
http://h18006.www1.hp.com/products/storageworks/solutions/dtmysapeva/index.html

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Local Replication Solutions (Software options)

The HP StorageWorks Business Copy is a local replication application for the EVA family. It incorporates Virtually Capacity-free Snapshot (Vsnaps), standard snapshots and Snapclone capabilities with an improved user interface to assist the storage administrator. This product is indispensable for critical data center operations such as non-disruptive backups, frequent snapshots of high value databases, and data mining. The bottom line benefits include improved disk capacity utilization and increased business continuity, data availability, and productivity savings.

HP OpenView Storage Volume Growth provides the ability to easily expand basic disk volumes on Windows 2000 or Windows Storage Server 2003 systems without disrupting the application environment or impact the user's data. This host based product supplements the volume expansion capabilities of the Enterprise Virtual Array providing a complete end-to-end solution.

EVA iSCSI Connectivity

EVA iSCSI support is available through the EVA iSCSI Connectivity Option. This powerful solution provides iSCSI connectivity to an EVA utilizing the EVA's existing FIbre Channel infrastructure.
The HP StorageWorks EVA iSCSI Connectivity Option extends the advantages of Fibre Channel SANs into smaller departments and remote locations. This EVA option allows customers to incorporate iSCSI servers within SANs without requiring additional storage arrays or management costs. Use the EVA's Command View software to manage the iSCSI connectivity to the array and mount the iSCSI device in the same rack as the array.
For more information:
http://h18006.www1.hp.com/products/storageworks/evaiscsiconnect/index.html

The EVA also supports the ProLiant iSCSI Feature Pack with a Proliant DL380 G4 or DL585 Storage Server. This product combination creates an iSCSI storage solution that is capable of hosting application storage (block), file, and print services on a single platform. The iSCSI Feature Pack is powerful and easy-to-use software that adds iSCSI target functionality to HP ProLiant Storage Server (NAS) devices. In addition, the DL380 and DL585 ProLiant Storage Servers are the perfect platforms from which to run Command View EVA, You can stretch your investment even further when you combine iSCSI connectivity, EVA management and NAS file and print serving capabilities in the same server.
For more information:
http://h18006.www1.hp.com/storage/nas.html

Product Highlights

EVA with HP Systems Insight Manager	Enclosed as an accessory with all StorageWorks arrays is HP Systems Insight Manager (SIM). HP SIM is the foundation for HP's unified server-storage strategy -- it is packaged as a no-cost, customer installable management application and is derived from the heritage of Compaq Insight Manager, HP Toptools, and HP Servicecontrol. HP SIM runs on HP Windows, Linux, and HP-UX and provides discovery and identification, fault management, security administration, asset reporting, and centralized configuration management across heterogeneous servers, storage and infrastructure. HP SIM is easily extensible, integrating other HP management products and value-add plug-ins such as the ProLiant Essentials, Integrity Essentials, and Server Essentials. HP SIM relies on industry standards like SMI-S, SNMP, SSH, WBEM, and WMI to detect and report heterogeneous device attributes. HP SIM may also be configured to launch array specific applications for configuration, reporting and replication. For more information on HP Systems Insight Manager see: http://www.docs.hp.com/en/netsys.html
Clustered Server and High Availability System Support	Dual and multi-node cluster support is provided for host level fault tolerance and high system availability. See the Operating System, Cluster and High Availability Compatibility table for operating system specific support.
Multi-Server Shared Support for Storage Consolidation	Heterogeneous and homogeneous host support provides the ability to share storage between multiple servers. The EVA provides storage access control (i.e. Selective Storage Presentation or LUN masking) assuring that a host cannot access data belonging to a different host. SAN-based zoning is also supported.
Single-pathing (Single HBA per host)	Single-pathing (or single HBA per host) support is provided for all supported operating systems (but may be version dependent). Use of single-pathing, which does not offer a redundant path option, should be used with care. Failure of the single HBA will result in loss of access for that host until the HBA is replaced.
Enclosure Capacity	The EVA provides one of the highest density disk storage solutions in the industry with up to 168 disk drives per cabinet for the EVA8000 along with four FC loop switches. The 42U HP 10000 G2 Series Rack supports up to twelve 3U 14-bay M5314B FC disk enclosures for a maximum capacity of 168 disk drives and a maximum storage capacity of 84 TB of disk capacity. An expansion cabinet allows users to expand with another six enclosures for a total of up to eighteen disk enclosures, up to 240 disks, and up to 120TB.

Product Highlights

Utility Pricing solutions for StorageWorks EVA

HP offers a spectrum of offerings allowing customers to align their payments according to the usage of storage capacity.

- For customers requiring assistance in managing their storage infrastructure, Managed Storage Solution (MSS) meets that need while providing the option to acquire storage on a utility model. Customers have the ability to choose other options like Backup/Restore, Data Availability, Local Copy and Remote Copy services. All these capabilities are offered at a $/GB/Month fee.
- For customers that want to build and manage their own storage utility, Utility Ready Storage (URS) provides customers with storage that never runs out; priced as the customer uses it; and is easy to procure. URS pricing is based on $/GB/Month of average allocated capacity over the customer's minimum commitment. URS provides a unique opportunity to allow customers access to storage when they need it, permitting them to adapt to their changing business needs.
- For customers whose need is best described by predictable growth, Pay per forecast (PPF), offered from HP Financial Services, is an ideal fit. It is a step lease based solution where the payments are structured upfront according to the customer's forecasted growth.
- For even further demanding financial needs of customers, HP Financial Services are ready to craft a customized solution for them.

Please contact your local HP representative for further information

10K rpm Drive Support

The EVA supports 72 GB, 146 GB, and 300 GB 10K rpm dual-ported 2 Gb/s FC disk. The EVA4000 will support up to 56 disk drives. The EVA6000 will support up to 112 disk drives. An EVA8000 will support up to 240 disk drives. The EVA arrays will support single or mixed drive capacities and types (high performance and FATA) within an enclosure. HP recommends using the same drive type (the same capacity) within a disk group because virtualization allocates space proportionate to the highest capacity drive with in the group.

15K rpm Drive Support

The EVA also supports 72 GB, and 146 GB 15K rpm dual-ported 2 Gb/s FC disk drives. The EVA arrays will support single or mixed drive capacities and types (high performance and FATA) within an enclosure. HP recommends using the same drive type (the same capacity) within a disk group because virtualization allocates space proportionate to the highest capacity drive within the group.

FATA Drive Support

The EVA supports 250, 400 and 500GB dual ported 2 Gb/s Fibre Attached Technology Adapted (FATA) disk. An EVA will support a full configuration of FATA disk drives. The EVA4000/6000/8000 can be configured with any combination of FATA and high performance disk drives; total raw capacity will vary based upon the redundancy (Vraid) selected. A minimum of eight FATA drives are required in a configuration.

FATA drives are designed for lower duty cycle applications such as near on-line data replication for back-up. These drives should not be used as a replacement for EVA's high performance, standard duty cycle, Fibre Channel drives. Doing so could shorten the life of the drive.

Please see the following URL for more information on FATA drives, their uses and their benefits
http://h71028.www7.hp.com/ERC/downloads/5982-7353EN.pdf

Product Highlights

Fibre Channel Technology

The EVA4000/6000/8000 takes advantage of the benefits of Fibre Channel (FC) in distance, performance and connectivity. The use of optical Fibre cabling allows distances between connected segments of a SAN to be up to 500 meters @ 1 Gb/s; 300 meters @ 2 Gb/s using short wave multi-mode cable and up to 10 kilometers (6.21 miles) @ 1 Gb/s when using long wave cable. The EVA4000/EVA6000/8000 with XCS v5.1 for HSV200 and HSV210 are 4 Gb/s enabled on each FC path, but will also support 2 Gb/s FC paths for backwards compatibility. Storage Area Networks (SANs) can be constructed using FC switches/directors for fabric connectivity (currently up to a maximum of 20 FC switches supported).

Fibre Channel Switch/Director Support

Support for up to twenty FC switches operating at 2 Gb/s and FC switches operating at 4 Gb/s allow the full benefits of a storage area network (SAN), providing exceptional connectivity while increasing the effective bandwidth of the network. Supported SAN features include Zoning for communication isolation and Inter-Switch Links (hops) up to 10 km. The EVA4000/6000/8000 supports 4 Gb/s FC enabled with XCS v5.1.
For more information on specific support specifications see the following Switch URL:
http://h18006.www1.hp.com/storage/saninfrastructure/switches.html

Transfer Speeds

The EVA4000/6000 has two FC host interfaces per HSV200 controller; four for a controller pair. The EVA8000 has four FC host interfaces per HSV210 controller; eight for a controller pair. Each controller-to-host interface is 4 Gb/s. The controllers are also compatible with 2 Gb/s and 4 Gb/s FC switches, HBAs, servers and other storage solutions.

Each EVA controller pair interfaces with M5314B drive enclosures either directly or through fibre channel loop switches. With 2 (for EVA4000/6000) and 4 (for EVA8000) device ports per controller and dual FC I/O modules per drive enclosure, each controller can connect to each FC drive A and B port. So each controller has a redundant path to each drive.

Easy Installation

The EVA4000/6000/8000 predefined models ship from the factory fully configured. After unpacking, they can be plugged into power sources, connected to the FC SAN, enabled and configured using Command View EVA and they are ready for use.

Installation and start-up services are part of the EVA Foundation Service Solution warranty.

Fault Recovery -- HP Continuous Access EVA for Disaster Tolerance Applications

HP StorageWorks Continuous Access EVA remote copy functionality is available for use with the EVA4000/6000/8000 arrays. For additional information about Continuous Access EVA visit:
http://h18006.www1.hp.com/storage/software.html

Continuous Access EVA is a controller-based application that performs real-time replication between HP StorageWorks Enterprise Virtual Arrays. The solution is enhanced to perform remote replication, and deliver high data availability and performance to users on Fibre Channel based campus, metro or continental Storage Area Networks (SANs).

HP StorageWorks Disaster Tolerant Solution for mySAP Business Suite on EVA offers a business continuance solution for SAP environments, where data integrity and value added functionality are high priorities. Best practices for implementing remote mirroring of an SAP database as part of an overall data protection strategy with SAP applications can be found at:
http://h18006.www1.hp.com/products/storageworks/solutions/dtmysapeva/index.html

Product Highlights

High Availability/ Fault Tolerance/ Hot pluggable support

All EVA are configured with dual HSV controllers that operate in a redundant mode. Each controller has redundant Fibre Channel (FC) host ports (2 for the EVA4000/6000 and 4 for the EVA8000). Each EVA4000/6000 controller has two FC device ports and the EVA8000 controller has four FC device ports. For the EVA4000/6000/8000 in the event of a path failure, the alternate paths to the controller can be utilized with the use of multi-path software in the Operating System or in Secure Path software.

On the EVA4000 each port connects to one FC I/O module on a drive enclosure. Up to four drive enclosures can be connected in a FC loop arrangement with a controller pair and connect to one port of up to 56 drives. With the two FC ports per controller, each controller can connect to both ports on up to 56 disk drives for redundant paths to all 56 drives. On the EVA6000 each port connects to a FC loop switch which in turn connects to one FC I/O module on up to nine drive enclosures and to one port of up to 112 disk drives. On the EVA8000 each port connects to a FC loop switch which in turn connects up to one FC I/O module on up to nine drive enclosures and to one port of up to 120 disk drives. With the four FC ports, each controller can connect to both ports on up to 240 disk drives for redundant paths to all 240 drives.

EVA8000 configurations, with more than four drive enclosures, are configured with two pairs of FC-AL switches connected between the two controllers and the drive enclosures. Up to nine drive enclosures can be redundantly connected to each pair of switches, which are redundantly connected to each controller. Each loop switch is independently powered and cooled. Should one loop switch fail, it can be replaced while I/Os continue through the remaining redundant loop switch.

The HSV controllers also have dual redundant hot plug power supplies and dual redundant hot plug blowers. Each controller has hot plug cache batteries to maintain cache contents for up to 96 hours in case of a total power failure.

The M5314B FC drive enclosure has dual redundant hot plug FC I/O modules that allow the controllers to distribute I/Os between the two modules and provides redundant paths should either FC I/O module become unavailable. The enclosure also has dual redundant hot plug power supplies and dual hot plug blowers. The enclosure also has a hot plug Environmental Monitoring Unit (EMU) to monitor and report the condition of the power supplies and fans. The EMU can be replaced without affecting I/O operations.

The FC and FATA disk drives have dual FC ports which can be redundantly accessed by each controller. The drives are hot plug. The drives can be arranged, using redundant Vraid1 or Vraid5 protection, so that a drive failure will not cause loss of data. Optional virtual sparing can be configured so that a drive failure will trigger an automatic rebuild of the Vraid1 or Vraid5 protection using the virtual spare.

All EVAs have dual redundant power distribution. Two independent power cords distribute power through two Power Distribution Units (PDUs) to each side of the EVA cabinets and to each power supply of the controllers and to each power supply of the drive enclosures and to each of the FC loop switches. Each cabinet power cord can be connected to independent power sources. For maximum availability, a customer should provide redundant power from independent power circuit breakers, independent power lines from the power company and even independent power companies.

Integration

All EVA4000/6000/8000 models are 4 Gb/s FC Switched Fabric "enabled" and can operate on 4 Gb/s or 2 Gb/s FC Switched Fabric SANs. They can co-exist in the same FC SAN with EVA3000 and EVA5000 FC storage solutions and many other SAN devices.

Product Highlights

Manageability

HP StorageWorks Command View EVA provides the capability to manage the EVA Array family and is installed on an existing Storage Management Appliance, a management server or a NAS server. This powerful tool provides an easy mechanism to manage up to 16 EVA units in a SAN configuration.
The Command View EVA media kit and license are required with all EVA models. Command View EVA is purchased separately from the HP StorageWorks EVA4000/6000/8000 controller media kit (XCS). HP Command View EVA requires a License to use (LTUs) equal to, or greater than the total raw capacity of each array.

Performance

Fibre Channel host connections provide up to 200 MB/s bandwidth for each path. Dual mirrored port write caching capability, with battery backed cache, maintains optimal availability while assuring data integrity in the event of a failure.

Each HSV200 controller (for EVA4000/6000 configurations) has two Fibre Channel host ports (four ports in a redundant pair of controllers) assuring the availability of bandwidth for the most demanding applications. In addition, up to 4GB of cache per controller pair ensures high performance.

Each HSV210 controller (for EVA8000 configurations) has four Fibre Channel host ports (eight ports in a redundant pair of controllers) assuring the availability of bandwidth for the most stringent applications. In addition, up to 8 GB of cache per controller pair ensures high performance.

Scalability

A storage management server can manage up to 16 EVA controller pairs (EVA 3000s, EVA5000s, EVA4000s, EVA6000s and/or EVA8000s) in any one fabric. An EVA controller pair will support up to 256 host connections (up to 1024 HBAs).

The EVA4000 will scale up to 56 disks (28TB using 500 GB FATA disk drives, and 16.8 TB using 300 GB high performance disk drives).
The EVA6000 will scale up to 112 disks (56TB using 500 GB FATA disk drives, and 37.6 TB using 300 GB high performance disk drives).

The EVA8000 will scale up to 168 disks in a single cabinet and with the addition of an optional utility cabinet, an EVA8000 will scale up to 240 disks(120TB using 500 GB FATA disk drives, and 72 TB using 300 GB high performance disk drives).

Configure to Order (CTO) options and the HP 10000 G2 Series Racks allow even greater server and device integration, flexibility and scalability for the EVA4000/6000. Data center managers can customize server, storage and back-up configurations as well as using the residual cabinet U space to mount Storage Management servers, switches and have the peace of mind that it is built with HP factory precision manufacturing. The new EVA8000 2C2D, 2C6D, and 2C12D, also allows customers to configure their new EVA8000 units from HP manufacturing with additional drive enclosures.

Product Highlights

EVA as Virtualized Storage behind the XP

HP StorageWorks EVA4000/6000/8000 disk arrays can be connected as external storage devices behind the XP12000.

The XP12000 simplifies the management of heterogeneous SAN environments through its ability to support up to 32 PB of external storage-all configured 'behind' a single XP12000. HP StorageWorks External Storage XP software uses advanced virtualization technology to allow storage administrators to host XP12000 Disk Array LUNs on externally attached storage subsystems. Any Fibre Channel port from any CHIP pair installed in any slot can be used to connect to an external EVA4000/6000/8000.

With external EVA storage, XP presents multiple tiers of storage to a wide range of host systems. Instead of seeing a confusing collection of arrays, host systems perceive all the data to be stored inside the XP disk array. In effect, the XP disk array becomes the storage controller for a flexible, multi-tiered collection of EVAs with a range of cost and performance capabilities. By configuring EVA storage arrays behind a single XP12000, data can be moved back and forth dynamically across tiers, all of which is invisible to the applications.

The XP12000's virtualization feature also reduces the total cost of storage ownership by:

- Exploiting common storage management across multiple vendors' systems
- Easily deploying a dual-vendor policy
- Facilitating simpler and lower cost data migrations
- Increasing storage utilization
- Extending the life of legacy storage

For more information please refer to the "XP10000/12000 External Storage Streams" document on External Storage located at: http://spock.corp.hp.com/streams/index.aspx?ArrayID=30

Servers Supported – Single and Clustered

HP servers (HP-UX, ProLiant, AlphaServers)
X86 servers
Dell servers
Sun servers
IBM servers

EVA Required Software

HP StorageWorks EVA4000/6000/8000 v5.1 controller media kit (XCS v5.1)
The HSV200 (for the EVA4000/6000) and HSV210 (for the EVA8000 controllers utilizes XCS v5.1 firmware
NOTE: As a convenience for customers, the EVA4000/6000/8000 ships with XCS pre-installed. HP StorageWorks EVA4000/6000/8000 v5.1 controller media kit contains both XCS v5.1 and v5.031 firmware for upgrades of existing 2 Gb EVA4000/6000/8000s.
NOTE: The minimum supported version of XCS on the 4Gb EVA4000/6000/8000 is XCS V5.1.

HP StorageWorks EVA Software Selector

The following matrix will assist in identifying some of the complimentary HP software products can be used along with the EVA to support various business applications. Please see your Sales Representative, or go to http://www.hp.com/ for more information on these valuable HP software products.

Just click on the product name and you will be linked to the product specification URL.

Product Highlights

	EVA Device and Configuration Management	Backup Solutions	Business Continuity/ Local Mirroring	Disaster Recovery/ Remote Mirroring	Storage Area Management	Server and Storage Management	Application Integration
HP Business Copy EVA		X	X				X
HP Continuous Access EVA				X			
HP Storage Essentials					X		X
HP Data Protector		X	X				X
HP Systems Insight Manager						X (Included with EVA)	
HP Command View EVA	X (Required)						
HP Fast Recovery Solution		X	X				X
HP Cluster Extension EVA				X			
HP Metrocluster/ Continentalcluster with Continuous Access EVA				X			
HP Storage Mirroring				X			

EVA and Value-added Software Compatibility

Model	VCS Software	HP Command View EVA*	HP Continuous Access EVA**	HP Business Copy EVA**
EVA4000/6000/8000	EVA4000/6000/8000 v5.1 controller media kit (XCS V5.1)	Command View EVA v5.0	Continuous Access EVA V2.3	Business Copy EVA v3.2

*NOTE: HP StorageWorks Command View EVA is required software for all EVA models. HP Command View EVA requires a License to use (LTUs) equal to, or greater than the total raw capacity of each array. If the EVA does not have the proper licensed capacity it will be in violation of the End User License Agreement (EULA)

**NOTE: HP StorageWorks Continuous Access EVA and HP StorageWorks Business Copy EVA requires a License to use (LTUs) equal to, or greater than the total usable amount of data being replicated on each array. If the EVA does not have the proper licensed capacity it will be in violation of the End User License Agreement (EULA)

Operating Systems, Cluster and High Availability Compatibility

Product Highlights

Operating System	Versions Supported	Cluster Server or High Availability Software	HA Versions Supported	Failover Software
Microsoft Windows	Windows 2000 Server SP4 & Update roll up 1 for SP4 Windows 2000 Advanced Server SP4 & Update roll up 1 for SP4 Windows 2003 Standard Edition (32/64-bit) SP1 Windows 2003 Enterprise Edition (32/64-bit) SP1 Windows Extended Systems SP1 (64-bit) Windows 2003 DataCenter Edition* (64-bit)	Microsoft Cluster Server (MSCS)	Windows 2000 Advanced Server Windows Server 2003 Enterprise Edition Windows 2003 DataCenter Edition* (64-bit)	MPIO DSM Full Feature for Windows (Available on HP web)
HP-UX	11i v1 (PA-RISC) 11i v2 (PA-RISC & Integrity)	HP ServiceGuard (Metro or Continental clusters)* Veritas Foundation Suite/HA	11.15 11.16 11.17 3.5 (11i v1) 4.1 (11i.v2)	PV-Links, Native in OS Secure Path V3.0F for HP-UX Veritas DMP 3.5 (11i v1) Veritas DMP 4.1 (11i v2)
Linux	Red Hat EL Advanced Server 3.0 (32/64-bit)- U3, U4 Red Hat EL Advanced Server 4.0 (32/64-bit) United Linux 1.0/SLES8 SP3 (32/64-bit) - UL1.0 SUSE/SLES9 (32/64-bit)	HP ServiceGuard for Linux VERITAS Foundation Suite/HA for Linux*	11.16 4.1	Qlogic Failover driver 7.xx.xx for Red Hat 3.0 and United Linux 1.0 Qlogic Failover driver 8.0x.xx for Red Hat EL AS 4.0 and SUSE/SLES9
HP Tru64 UNIX	v5.1b-2 v5.1b-3	HP TruClusters	5.1b	Native in OS
HP OpenVMS	7.3-2 Alpha 8.2 Integrity & Alpha 8.2-1 Integrity	HP OpenVMS Clusters	7.3-2 with FIBRE_SCSI-V0200) 8.2 8.2-1	Native in OS
Sun Solaris	8 9 10	SunCluster VERITAS Foundation Suite/HA	3.1 3.5, 4.0, 4.1	MPxIO for Solaris, Native in OS Veritas DMP 3.5, 4.0, 4.1
IBM AIX	5.2 5.3	HACMP	5.2, 5.3	MPIO for IBM AIX, Native in OS
Novell NetWare	5.1 SP8 6.5 SP4	NetWare cluster server	1.01	MPIO for NetWare, Native in OS
VMware	ESX 2.5.2 (GSX & WSX Application support)	-MSCS Clustering**	Windows 2000 Advanced Server Windows Server 2003 Enterprise Edition Windows 2003 DataCenter Edition (64-bit)*	MPIO for VMWare, Native in OS

Product Highlights

*NOTE: Follows initial release, check posted Operating Specific Release Notes or software documentation
**NOTE: For more detailed information on Cluster Server Support see the VMWare Release Notes

http://h18006.www1.hp.com/products/storageworks/eva8000/index.html

Cabinet Density	A single 42U EVA cabinet can house up to 84.0 TB of raw capacity (using 500 GB FATA disks). NOTE: Maximum cabinet capacity will vary based available upon U space. The total number of controllers, enclosures supported and other devices. For example, the Rack System/E when fully configured with an EVA8000 support a maximum of 11 enclosures.
Racking Guidelines and Power Distribution	EVA8000 racks (based on the HP 10000 G2 Series Rack) are equipped with suitable 0U Power Distribution Units (PDUs) according to the voltage used in the country the solution is ordered. These PDUs provide redundant power and are located in the bottom and back of the cabinet for power cable entrance by the floor. The PDUs are 220/240V. The 220/240V PDUs are 0U high with a total of two AC power cords extending outside the cabinet. For the EVA4000 and EVA6000 a variety of HP 10000 G2 Series Rack offerings and integration options are available. The EVA configurator tools utilize a 42U HP 10000 G2 Series Rack as the standard recommendation and will provide a 220/240V PDU and country specific power cords. The EVA4000/6000 t configurations can be customized to meet a wide variety of customer needs. Both the height and types of rack and PDUs can be modified based upon the specific customer need. If other devices, such as servers, switches or back-up devices, are to be installed with the EVA; this can be specified and the cabinets and PDUs can be modified to support the configuration. The EVA4000/6000 also support 36U racks and 100V PDU (Supported in Japan Q206). The EVA also supports the Rack System/E and 5642 (42U) Rack Cabinet System as field installed options. Various PDU sizes are available with the Rack System/E as well as additional accessory choices such as blanking panels, doors and sides. For redundancy, order PDUs in quantities of two. The Rack System/E provides the capability of supporting HP-UX servers, switches, as well as additional EVA components (chose the PDU with the appropriate amperage for optional and additional components). For more information on configuration and PDU support for the 5642 (42U) Rack Cabinet System please see the following URL: http://h18004.www1.hp.com/products/quickspecs/12074_na/12074_na.html
Total Cost of Ownership	The unique virtual architecture allows up to twice the normal effective capacity utilization of traditionally architected storage offerings. And with Virtually Capacity-Free Snapshot (Vsnap), significant duplicate capacity requirements can be eliminated resulting in fewer/smaller storage acquisitions. The EVA has one of the highest density disk storage solutions in the industry. Additionally, the unique virtual architecture allows up to twice the normal effective capacity utilization of traditionally architected storage offerings. And with the virtually Capacity-Free Snapshot (Vsnap), FATA disk drives and the ability to change Vraid types, significant amount of duplicate capacity requirements can be eliminated, resulting in fewer/smaller storage acquisitions.

HP Care Pack Services

HP Care Pack Services offer upgraded service levels to extend and expand your standard product warranty with easy to buy, easy to use support packages that help you make the most of your hardware and software investments. They let you choose the support levels that meet your business requirements, from basic to mission-critical. They help you contain total cost of ownership.

HP Care Pack warranty extensions can be purchased along with HP products to cost-effectively upgrade or extend your warranty. For many products, post-warranty HP Care Pack Services are available when your original warranty has expired.

Why purchase an HP Care Pack service?

Your standard warranty protects against product defects. HP Care Pack Services help you guard against unplanned downtime, which can reduce your productivity and profitability. These convenient service packages:

- Protect your investment in HP products
- Provide consistent, predictable levels of support across your entire department or business
- Ease budget planning with fixed-cost support that includes parts and labor
- Give you direct access to proven technical and problem-solving expertise
- Offer a choice of response-time and repair-time commitments
- Deliver prompt, measurable results
- Are available whenever and wherever you do business

HP Care Pack availability may vary by country and product.

Supporting your Adaptive Enterprise journey

HP Services helps you make the Adaptive Enterprise real for your organization. The breadth, depth, and quality of HP hardware and software support services can help you **improve the performance** of your IT support processes and resolve the complex software and hardware problems that tax user productivity. HP Care Pack services help you **increase IT environment stability**, efficiency, and agility from the desktop to the data center, and improve the productivity of your employees.

Warranty and Services Included with the Product

EVA4000/6000/8000 factory warranty includes Array Installation and Startup Service, 2-year hardware support, with 4-hour response on a 24x7 basis as well as 2-year, 24x7 XCS phone-in support and updates.
HP warrants only that the Software media will be free of physical defects for a period of ninety (90) days from delivery. In countries where available, your HP Warranty includes support for Customer Self Repair and Customer Self Upgrade.

Please refer to HP's Limited Warranty Statement for further details:
http://h18006.www1.hp.com/products/storageworks/warranty.html

For more information about HP's Global Limited Warranty and Technical Support, visit
ftp://ftp.compaq.com/pub/products/storageworks/warranty/EN_321708-008.pdf

HP warrants the HP 10000 G2 Series Rack according to the standard rack product warranty.
Please refer to product specification for further details:
http://h18004.www1.hp.com/products/servers/proliantstorage/racks/index.html

Service and Support, HP Care Pack, and Warranty Information

Recommended Services	HP SAN Solution Service	• Quickly realize the benefit of your SAN investment while reducing overall cost of ownership • Fast, expert implementation that guards against unexpected compatibility issues, minimizes disruption to your business and optimizes performance • Provides a fully installed, configured and documented SAN with scalability that allows for additional capacity as your business grows
	HP Critical Services	• Boost business productivity through increased server, storage, networking, and applications availability • Minimize business losses caused by IT downtime • Reduce risk and improve efficiency by proactively managing changes across your IT environment • Resolve complex problems quickly through direct access to HP Services expertise and hands-on assistance • Rapidly access single-source support from a team familiar with your business and technology infrastructure • Free your IT staff to focus on strategic business issues
	HP Proactive 24	• Enhanced operational effectiveness and availability with proactive problem identification and solutions recommendations • Partner with technical experts who help coordinate support, provide hands-on assistance, and share industry best practices and HP know-how with your staff • Rapidly access single-source support spanning your environment from servers to storage to networking • Obtain personalized services tailored to your business environment and objectives • Anticipate necessary change - and execute it correctly the first time • Efficiently manage infrastructure resources to meet your performance objectives
	HP Support Plus 24	• 24x7 4-hr. onsite hardware support • Material and parts included • Work to completion for hardware support • 24x7 2-hr response XCS phone-in assistance • Remote problem diagnosis & support • Escalation management • Software product and documentation updates • License to use and copy software product updates • Software electronic support
	HP Software Maintenance Service	• Improve the productivity of system managers and operators • Improve system performance and reduce downtime due to software defects • Expedite problem resolution through expert-level technical resources • Enjoy consistent service coverage across geographically dispersed sites • Update HP and selected third-party software at a predictable cost • Take advantage of subscription savings on software updates • Keep your license compliancy up-to-date

Service and Support, HP Care Pack, and Warranty Information

Available HP Care Pack Services

Extend your product warranty with a wide choice of cost-saving support packages.

HP Care Pack Services are sold by HP and HP authorized enterprise and commercial resellers. Services for customers purchasing via direct and enterprise resellers are quoted using HP order configuration tools. Additional information about HP Care Pack Service features and benefits is available at http://www.hp.com/hps/carepack/services/.

Key for HP Care Pack Service availability in the table below:
E = Service available for customers purchasing direct and via enterprise resellers
C = Service available for customers purchasing via commercial resellers
N/A = Service not applicable

HP Care Pack Services Deployment and Per Event Services	Service Available
HP Installation	N/A
HP Installation & Startup	Included
HP Implementation	E

For more information about Deployment and Per Event Services for HP Storage, visit http://www.hp.com/hps/storage/.

HP Care Pack Services Availability Services	1 yr	3 yr	4 yr	5 yr
HP 4 Hr, 24x7 Hardware Support	N/A	E/C	E/C	E/C
HP Software Support	E/C	E/C	E/C	E/C
HP Software Support 24x7	E/C	E/C	E/C	E/C
HP Support Plus	E/C	E/C	E/C	E/C
HP Support Plus 24	E/C	E/C	E/C	E/C
HP Proactive Essentials 24x7 Unlimited	E/C	E/C	E/C	E/C
HP Proactive 24 Service	E	E	E	E
HP Critical Service	E	E	E	E

To find HP Care Pack Services available via HP authorized commercial resellers, visit http://h30125.www3.hp.com/csn/salesmktg/elfpack/elf_nonlkup_ctrylang.asp?code=ELNL

Deployment and Per Event Service Descriptions

Availability Assessment for SANs

- Recommendations for reducing or eliminating risks to the availability of your SAN infrastructure.

SAN Solution Service

- You get a powerful network storage solution up-and-running quickly and efficiently with minimum disruption and rapid returns on your SAN investment.

Data Migration

- Transfers your critical information to a new or reconfigured storage array in an open systems environment - across a data center or around the world.

Data Replication Solution Service

- Ensures a timely, cost-effective deployment of your data replication solution cuts risk and shortens your time-to-results.

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eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit http://www.hp.com/support

Instant Support Enterprise Edition (ISEE)

HP Instant Support Enterprise Edition (ISEE) provides a single remote monitoring and support solution for your IT data center. ISEE uses continuous hardware event monitoring and automated notification to identify and prevent potential critical problems.
ISEE is a no charge feature of the EVA Foundation Service Solution warranty. Notification and status information can be sent to a HP Service Center or provided for customer monitoring.

For more information or to download ISEE, visit http://www.hp.com/go/instantsupport

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HP Education Services

Training for the Enterprise Virtual Array is now offered as part of HP comprehensive curriculum of HP Storage, Storage Management, and IT Service Management courses. These courses will provide the training required to realize the full potential of your HP EVA Virtual Array storage solutions, optimize your systems and SAN for highest efficiency, and achieve better return on your IT investments.

For more information about HP Education Services for Storage and SAN, visit
http://education.hp.com/curr-storsan.htm

Awards

HP IT Resource Center (ITRC) and HP Business Support Center (BSC) were selected as two of the Association of Support Professional's (ASP) Top Ten award winners in its seventh annual Ten Best Web Support Sites competition for 2004, an award that showcases excellence in online service and support.
http://www.hp.com/hpinfo/newsroom/press/2004/040616a.html

HP earned the No. 1 ranking in customer satisfaction among vendors of corporate information technology (IT) service and support, according to the newly released Technology Business Research Inc.'s Corporate IT Service and Support survey covering the first quarter of 2004.
http://www.hp.com/hpinfo/newsroom/press/2004/040624a.html

Additional Services Information

For more information about Deployment, Per Event, Consulting and Education services for HP Storage, visit: http://www.hp.com/hps/storage/
For more information about HP Care Pack Services for Storage, visit:
http://www.hp.com/hps/carepack/storage/cp_networked.html
For more information about HP Storage Software, services and updates, visit:
http://h18006.www1.hp.com/storage/software.html
If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP" http://www.hp.com

Family Information

Model	EVA4000	EVA6000	EVA8000	EVA8000 With expansion cabinet
Drive Interface	Dual ported 2 Gb/s FC-AL	Dual ported 2 Gb/s FC-AL	Dual ported 2 Gb/s FC-AL	Dual ported 2 Gb/s FC-AL
Controller Software	XCS v5.1	XCS v5.1	XCS v5.1	XCS v5.1
Cache per controller pair	4GB	4GB	8GB	8GB
RAID Support	Vraid0, Vraid1, Vraid5 and Cross Vraid Snaps	Vraid0, Vraid1, Vraid5 and Cross Vraid Snaps	Vraid0, Vraid1, Vraid5 and Cross Vraid Snaps	Vraid0, Vraid1, Vraid5 and Cross Vraid Snaps
Host ports	Four 4 Gb/s FC	Four 4 Gb/s FC	Eight 4 Gb/s FC	Eight 4 Gb/s FC
Device ports	Four 2 Gb/s FC-AL	Four 2 Gb/s FC-AL	Eight 2 Gb/s FC-AL	Eight 2 Gb/s FC-AL
Device FC-AL switches	0	2	4	4
Maximum Drives per model	56	112	168	240
Redundant Controllers	Yes	Yes	Yes	Yes
Drive Capacities	72 10K rpm 146 GB 10K rpm 300 GB 10K rpm 72 GB 15K rpm 146 GB 15K rpm 250 GB FATA 400 GB FATA 500GB FATA	72 10K rpm 146 GB 10K rpm 300 GB 10K rpm 72 GB 15K rpm 146 GB 15K rpm 250 GB FATA 400 GB FATA 500GB FATA	72 10K rpm 146 GB 10K rpm 300 GB 10K rpm 72 GB 15K rpm 146 GB 15K rpm 250 GB FATA 400 GB FATA 500GB FATA	72 GB 10K rpm 146 GB 10K rpm 300 GB 10K rpm 72 GB 15K rpm 146 GB 15K rpm 250 GB FATA 400 GB FATA 500GB FATA

Step 1 - Choose a Base EVA Model

CTO Factory integration part number (Required)

Step 2 - Choose a Rack - Base and Factory Integration Information

Factory Integration

Start your order by choosing a rack to house your EVA4000/6000 based on the HP 10000 G2 Series Rack.

NOTE: When choosing an EVA configuration, start with an EVA configuration "equal to" or "closest but smaller" than the desired final configuration. Factory configuration rules will not allow a unit to be built up past the starting point for another standard configuration. (For example for an EVA6000 2C6D choose an EVA6000 2C4D plus 2 M5314B; not an EVA4000 2C1D plus 5 M5314B enclosures and FC Dual loop switch.) Orders that do not follow these conventions will be unable to be processed.

CTO Factory integration part number (Required)

325584-888

Primary Configuration Rules

Use of the Factory Integration part number is required for component integration. The EVA4000/6000 will be configured into a 42U HP 10000 G2 Series Rack with the appropriate PDU. If other products such as servers or back-up products are included in the cab a different PDU will be added (if required) or can be chosen from a list of appropriate offerings. HP 10000 G2 Series Rack must be purchased. Additional EVA4000/6000 bundles and drive enclosures may be ordered for multiple subsystem integration at the factory. Additional cabs are required to house configurations beyond the U-space of the initial cabinet.

The EVA4000/6000 controller pair assembly is available for field installation. The EVA4000/6000 controller pair assembly should be ordered for field installation. HP Global Services will perform the on-site installation when an EVA4000/6000 controller pair assembly is ordered.

The Rack System/E cabinets (choice of 41U, 33U and 25U heights) and 5642 (42U) Rack Cabinet System are supported for field installation. These racks may be purchased along with EVA component pieces for assembly in the field. The HP 5642 rack system is an entry level rack with sufficient features for easy access and ease of use.

When calculating available U-space, assume that no space will be placed between the mounted components.

Cabinets

NOTE: The number of subsystems varies and is determined by the interior U-space of the cab.

HP Rack 10642 G2 Shock (42U)	AF002A
HP Rack 10642 G2 w/Extn Shock (42U)	AF004A
HP Rack 10642 G2 (no door) Shock (42U)	AF005A
HP Rack 10642 G2 w/Extn (no door) Shock (42U)	AF006A
HP Rack 10636 G2 Shock (36U)	AF012A
HP Rack 10636 G2 w/Extn Shock (36U)	AF014A
HP Rack 10636 G2 (no door) Shock (36U)	AF015A
HP Rack 10636 G2 w/Extn (no door) Shock (36U)	AF016A

http://h18004.www1.hp.com/products/servers/proliantstorage/racks/10000series.html

Configuration Information and Configuration Rules

HP Rack 5642 System for Field Installation	5642 (42U) Rack Cabinet System For additional cabinet accessories see: http://h18000.www1.hp.com/products/quickspecs/12074	358254-B21
Rack System/E Cabinets for Field Installation	HP Rack System/E41 Quartz (41U)	A4902A
	HP Rack System/E41 Graphite (41U)	A4902D
	HP Rack System/E33 Quartz (33U)	A4901A
	HP Rack System/E33 graphiote (33U)	A4901D
	HP Rack System/E25 (25U)	A4900A
PDU for Rack System/E Cabinets	Various PDU sizes are available with the Rack System/E as well as additional accessory choices such as blanking panels, doors and sides. For redundancy, order PDUs in quantities of two. Refer to the Configuration and User Guide in the Information Library at the Rack Solutions webpage. For additional cabinet accessories see: http://www.hp.com/go/enclosures	
Field Installation	Please refer to the Expansion options (Step 4) - listed in the Configuration Information and Configuration Rules - for details on components available for field installation. These components are useful for adding EVA4000/6000/8000 components to existing EVA4000/6000/8000 storage configurations or into on-site customer-supplied racks.	
Non-HP rack and power requirements	For detailed information on determining compatibility of a non-HP rack, please visit http://www.hp.com/go/eva. NOTE: Also refer to Step 4 for ordering instructions and components that accommodate on-site installation of EVA4000/6000/8000 subsystems into customer-supplied racks.	

Step 3 - Select Base Model - Base and Factory-Integration Information

EVA4000/6000 Models — The following models are available worldwide - each includes HW, varied storage capacity, and Installation and Startup service, 2 years of Virtual Controller Software (XCS) phone-in support and updates, and automated event notification and remote problem intervention.

Models

Enterprise Virtual Array 4000/6000/8000 Independent Bundles	The following models are available worldwide - each includes HW, varied storage capacity, and Installation and Startup service, 2 years of Virtual Controller Software (XCS) phone-in support and updates, and automated event notification and remote problem intervention. Factory Integration is required for all factory built models. The EVA4000/6000/8000 Models are modular and scalable storage solutions designed to have no-single-point-of-failure, which provide disaster tolerance and business continuance support for storage consolidation on heterogeneous SANs.	
EVA4000-A 2C1D Model Independent Bundle	Includes one 4U Controller assembly with two HSV200 controllers, one M5314B 3U 14-bay disk drive enclosure, cables, and appropriate mounting hardware. NOTE: A rack must be ordered with this selection. Additional M5314B disk drive enclosures may be added to a maximum of four disk drive enclosures. Multiple EVA4000s can be configured in a single cabinet.	AD554B
EVA6000-A 2C4D Model Independent Bundle	Includes one 4U Controller assembly with two HSV200 controllers, four M5314B 3U 14-bay disk drive enclosures, a dual loop switch option, cables, and appropriate mounting hardware. NOTE: A rack must be ordered with this selection. Additional M5314B disk drive enclosures may be added to a maximum of four disk drive enclosures. Multiple EVA6000s can be configured in a single cabinet.	AD556B

Configuration Information and Configuration Rules

EVA8000-A 2C2D 60Hz 42U Cabinet - without loop switches	A 4U controller assembly with two HSV210 controllers and two M5314B 3U dual-redundant FC Loop 14-bay disk enclosures in a 42U Storage Cabinet. It can be Factory Configured with additional drive enclosures. For configurations with more than four Drive enclosures the FC loop switches must be included. It can also be field upgraded up to a 2C12D configuration with the addition of drive enclosures and FC loop switches.	AD518B
EVA8000-A 2C2D 50Hz 42U Cabinet - without loop switches	A 4U controller assembly with two HSV210 controllers and two M5314B 3U dual-redundant FC Loop 14-bay disk enclosures in a 42U HP 10000 G2 Series Rack. It can be Factory Configured with additional drive enclosures. For configurations with more than four Drive enclosures the FC loop switches must be included. It can also be field upgraded up to a 2C12D configuration with the addition of drive enclosures and FC loop switches.	AD519B
EVA8000-A 2C6D 60Hz 42U rack- with loop switches	A 4U controller assembly with two HSV210 controllers, six M5314B 3U dual-redundant FC Loop 14-bay disk enclosures, and four 12-port FC loop switches in a 42U HP 10000 G2 Series Rack. It can be Factory Configured with additional drive enclosures. It can also be field upgraded up to a 2C12D configuration with the addition of drive enclosures.	AD520B
EVA8000-A 2C6D 50Hz 42U rack- with loop switches	A 4U controller assembly with two HSV210 controllers, six M5314B 3U dual-redundant FC Loop 14-bay disk enclosures, and four 12-port FC loop switches in a 42U HP 10000 G2 Series Rack. It can be Factory Configured with additional drive enclosures. It can also be field upgraded up to a 2C12D configuration with the addition of drive enclosures.	AD521B
EVA8000-A 2C12D 60Hz 42U rack- with loop switches	A 4U controller assembly with two HSV210 controllers, twelve M5314B 3U dual-redundant FC Loop 14-bay disk enclosures, and four 12-port FC loop switches in a 42U HP 10000 G2 Series Rack.	AD522B
EVA8000-A 2C12D 50Hz 42U rack - with loop switches	A 4U controller assembly with two HSV210 controllers, twelve M5314B 3U dual-redundant FC Loop 14-bay disk enclosures, and four 12-port FC loop switches in a 42U HP 10000 G2 Series Rack.	AD523B

Enterprise Virtual Array Field Installation	Please refer to the Expansion options (Step 4) - listed in the Configuration Information and Configuration Rules - for details on components available for field installation. These components are useful for adding EVA components to existing EVA storage configurations or into on-site customer-supplied racks.

Step 4 - Firmware

Configuration Information and Configuration Rules

Controller Firmware

NOTE: One HP StorageWorks EVA4000/6000/8000 v5.1 controller media kit is required per HSV200 and HSV210 controller pair. Separate Media kits and licenses are required to support HP Continuous Access EVA and HP Business Copy EVA.

HP Command View EVA V5.0 is mandatory. An HP Command View License-to-Use (LTU) must be purchased for each EVA controller pair. Each HP EVA must be licensed with the appropriate HP Command View LTU(s) to be in compliance with the End User License Agreement (EULA).

The licensed capacity per EVA must be equal to, or greater than the total raw capacity of each EVA. HP Command View EVA may be purchased in increments of a 1TB LTU (one or multiple 1TB LTUs based upon the EVA's raw capacity), or an HP Command View Unlimited Capacity LTU may be purchased which will support up to the maximum raw storage capacity of the EVA.

OPTIONAL SOFTWARE: EVA4000/6000/8000 optional software can be found a the following URL: http://h18006.www1.hp.com/storage/software.html

HP StorageWorks EVA4000/6000/8000 v5.1 controller media kit	T4256C

Step 5 - Hard Disk Drives

Drives are orderable two ways - either with the purchase of an array, or as add-on drives for arrays already installed. There are different product numbers for Upgrade drives than Initial-installation drives

HP StorageWorks FC Drives - Factory installation

NOTE: Four (4) disk drives, either size/type, are required per disk enclosure per system. A minimum of eight (8) disk drives are required per EVA4000/6000.

72 GB 10K rpm dual-port 2 Gb/s FC-AL 1-inch (2.54 cm) drive	238921-B23*
146 GB 10K rpm dual-port 2 Gb/s FC-AL 1-inch (2.54 cm) drive	293556-B23*
300 GB 10K rpm dual-port 2 Gb/s FC-AL 1-inch (2.54 cm) drive	364622-B23*
72 GB 15K rpm dual-port 2 Gb/s FC-AL 1-inch (2.54 cm) drive	293568-B23*
146 GB 15K rpm dual-port 2 Gb/s FC-AL 1-inch (2.54 cm) drive	364621-B23*

HP StorageWorks FATA Drives - Factory installation

250 GB FATA disk dual-port 2GB FC Hybrid disk drive factory integrated	364437-B23*
400 GB FATA disk dual-port 2Gb FC Hybrid disk drive factory integrated	382241-B23*
500 GB FATA disk dual-port 2Gb FC Hybrid disk drive factory integrated	370790-B23*

NOTE: There is a minimum order requirement, with the first installation of FATA add-on drives on an EVA, a minimum of 8 FATA drives are required to create the new NearOnline disk group.

*NOTE: 0D1 will appear after this part number on your sales order indicating factory integration

Step 6 - Cables

FC cable - Copper SFP	The following cables are used with the M5314 and M5314A drive enclosure but are not necessary for new installations. These cables are for use inside the cab between the controllers and drive enclosures if replacement cables are required.	
	Cable FC Copper SFP .6m	321624-B21
	Cable FC Copper SFP 2m	324394-B21
4Gb Upgrade Cable Kit	The following cable kit is for use in upgrading the cables between the switches and the M5314B enclosures for older EVAs to the new 4Gb EVA4000/6000/8000	
	HP StorageWorks 4Gb Cable Kit	AG311A
FC Loop Switch Kits	This option is mandatory when upgrading the EVA4000 2C1D to and EVA6000 with 5 shelves or higher.	
	HP EVA Dual Loop Switch Option	AD557B
	The EVA8000 2C2D customers have the option to convert to a 2C6D - or 2C12 with the installation, by trained Service Engineers, of the FC Loop Switch Option. This option is mandatory when upgrading the 2C2D to 5 shelves or higher.	
	EVA8000 FC Loop Switch Option Contains four FC loop switches, mounting hardware and cables. NOTE: This kit is mandatory when upgrading the 2C2D to 5 shelves or higher. 3U spare space is required to install the FC Loop Switch Kit.	AD553B
2 Gb/s SFP (Small Form- Factor Profile) Transceiver	2 Gb/s SFP Fibre Channel Transceiver Kit NOTE: Used on 2Gb switches with SFP Ports.	221470-B21
4 Gb/s SFP (Small Form- Factor Profile) Transceiver	4 Gb/s SFP Fibre Channel Transceiver Kit NOTE: Used on 4Gb switches with SFP Ports.	A7446B
FC cable - 1 Gb to 2 Gb/s (optional) (LC to SC)	NOTE: Before selecting the FC cables to connect between the controllers and the switches, check to see what kind of connectors are on the switches that will be connected to the controllers. New switches utilize a Small Form-Factor Profile (SFP) connector. The SFP connector can support 2 Gb I/Os and/or 1 Gb I/Os, but the device connected to it may not currently be enabled for 2 Gb. The SFP connector is also referred to as an LC connector. The older large form factor 1 Gb connector is also referred to as an SC connecter.	
	NOTE: The 2 Gb SFPs on the ports of the EVA4000 HSV100 and EVA6000 HSV200 controllers are a smaller form factor than 1 Gb SFPs. One of these cables (either LC to SC or LC to LC) is required per FC port of each HSV controller.	
	FC Short Wave 2-Meter Cable, LC/SC (1 Gb to 2 Gb)	221691-B21
	FC Short Wave 5-Meter Cable, LC/SC (1 Gb to 2 Gb)	221691-B22
	FC Short Wave 15-Meter Cable, LC/SC (1 Gb to 2 Gb)	221691-B23
	FC Short Wave 30-Meter Cable, LC/SC (1 Gb to 2 Gb)	221691-B26
	FC Short Wave 50-Meter Cable, LC/SC (1 Gb to 2 Gb)	221691-B27
FC cable - 2 Gb/s to 2 Gb/s (optional)(LC to LC)	NOTE: SFP - Small Form-Factor Profile on the ports of the EVA4000/6000/8000. One of these cables (LC to LC) is required per FC port of each HSVcontroller.	
	2-meter LC-LC Multi-Mode Fibre Cable	221692-B21
	5-meter LC-LC Multi-Mode Fibre Cable	221692-B22
	15-meter LC-LC Multi-Mode Fibre Cable	221692-B23
	30-meter LC-LC Multi-Mode Fibre Cable	221692-B26
	50-meter LC-LC Multi-Mode Fibre Cable	221692-B27

Step 7 - Management and High Availability Required Software

EVA Storage Management / User Interface

NOTE: Command View v5.0 is required to support the EVA4000/6000/8000 with XCS v5.1, running on either a management server or application host running Microsoft Windows or the HP OpenView Storage Management Appliance is required per SAN fabric containing an Enterprise Virtual Array.

An HP Command View License-to-Use (LTU) must be purchased for each EVA controller pair. Each HP EVA must be licensed with the appropriate HP Command View LTU(s) to be in compliance with the End User License Agreement (EULA). The licensed capacity per EVA must be equal to, or greater than the total raw capacity of each EVA. HP Command View EVA may be purchased in increments of a 1TB LTU (one or multiple 1TB LTUs based upon the raw capacity), or an HP Command View Unlimited Capacity LTU may be purchased which will support up to the maximum raw storage capacity of the EVA.

See the HP StorageWorks Command View EVA QuickSpecs for detailed licensing, support and configuration information:
http://h18006.www1.hp.com/products/storage/software/cmdvieweva/index.html

Storage Management Appliance

The HP OpenView Storage Management Appliance is a combined hardware and software solution that provides a centralized point for configuration, management and monitoring of storage elements, including switches and storage devices, while simplifying management tasks and reducing cost. It offers a comprehensive and cost-effective configuration, monitoring and storage management solution for the multiple platform SAN. Designed to connect directly to a SAN fabric, the Storage Management Appliance is a host-independent system that performs management functions without requiring host computers.

Windows based management server

HP StorageWorks Command View EVA v5.0 supports installation on a server running Microsoft Windows.

High Availability Software

Industry popular multiple path software is supported on the EVA4000/6000/8000. This software is used to manage multiple paths between hosts and storage systems. It enables high availability through path management and I/O load balancing. Multiple Path support is available for the following Operating Systems:

- HP-UX - HP Secure Path v3.0F SP1 , pvlinks native in HP-UX and Veritas DMP
- Windows - Full featured MPIO, available from HP
- Linux - QLogic Failover driver, available from QLogic /HP
- Tru64 - native in OS
- OpenVMS - native in OS
- AIX - MPIO native in OS
- Solaris - MPxIO native in OS, Veritas DMP available from Veritas
- NetWare - MPIO native in OS
- VMWare - MPIO native in OS

Refer to: http://h18006.www1.hp.com/products/storage/software/multipathoptions/index.html

Step 8 - Expansion Options

The EVA4000/6000 and EVA8000 Controller Pair assembly is for on-site installation into existing EVA configurations (or qualified rack systems) by HP Global Services. The physical configuration services for the EVA Controller Pair and up to four M5314B FC drive enclosures, as well as installation and startup services, are included when you purchase the controller pair assembly component.

Configuration Information and Configuration Rules

Optional Controllers and Accessories

EVA4000/6000 Controller Pair assembly — AD525B
Solution: One 4U Controller assembly with two HSV200 controllers, mounting hardware, cables, Installation and Startup service, 2 years of EVA4000/6000/8000 controller software (XCS) phone-in support and updates, automated event notification and remote problem intervention, included with this component.

EVA8000 Controller Pair assembly — AD524B
Solution: One 4U Controller assembly with two HSV210 controllers, mounting hardware, cables, Installation and Startup service, 2 years of EVA4000/6000/8000 controller software (XCS) phone-in support and updates, automated event notification and remote problem intervention, included with this component.

M5314B FC Drive Enclosures & Accessories

Select M5314B drive enclosures to expand EVA configurations: Drive enclosures may be:

1. Ordered for on-site capacity additions to existing EVA4000/6000/8000 configurations.
2. Ordered for field installation of complete EVA4000/6000/8000 configurations in conjunction with the EVA4000/6000 or EVA8000 controller pair assembly into the supported HP cabinets and racks described in Step One or into qualified 3rd party rack systems by HP Global Services.
3. Installed by HP manufacturing into EVA configurations by ordering the enclosure with the factory integration part number.

Up to four drive enclosures are supported with each pair of HSV200 controllers (EVA4000/6000) without a loop switch and up to 8 with 2 loop switches. Up to 18 drive enclosures are supported with each pair of HSV210 (EVA8000) and 4 loop switches.

M5314B FC Drive Enclosure
The M5314B is a 3U dual-redundant FC Loop 14-bay disk enclosure with mounting hardware, and the necessary copper FC cables for connecting to an HSV200 Controller pair.
NOTE: Minimum of four disk drives, any size/type, are required per disk enclosure per factory configured enclosures.
NOTE: 0D1 will appear after this part number on your sales order when factory integration is indicated. — AD542B

Dual FC Loop Switch Option

Select the EVA Dual FC Loop Switch Option for EVA4000 configurations when future expansion greater than a 2C4D configuration is expected. The EVA Dual FC Loop Switch Option can also be field installed to an EVA4000 to upgrade to an EVA6000. The EVA8000-A FC Loop Switch Option for the EVA8000-A 2C2D configuration is required for configurations above 4 enclosures.

EVA Dual FC Loop Switch Option for EVA6000 — AD557B*
Contains two FC loop switches, mounting hardware and cables.

EVA8000-A FC Loop Switch Option — AD553B*
Contains 4 FC loop switches, mounting hardware and cables

Configuration Information and Configuration Rules

Enterprise Virtual Array Racking for Expansion

The EVA customers have the option to mount supported devices in the rack used for EVA8000 expansion.

EVA 42U HP 10000 G2 Series Rack	AF002A
EVA8000 power requirements vary based on the equipment to be placed in the rack and the country power supply. Options are:	
Modular PDU 24A Low Volt, NA/JPN	252663-D71 #0D2
Modular PDU 24A HV, NA/JPN	252663-D72 #0D2
Modular PDU 32A HV, INTL	252663-B31 #0D2
NOTE: #0D2 feature code designates the PDU is mounted horizontally in the bottom of the rack on real rail, above any UPS, and occupies 1U EIA space	
Low voltage PDU 252663-D71 requires power cord w/NEMA 5-15 Plug	267555-001

Enterprise Virtual Array Expansion Cabinet Example Configurations

Expansion Cabinet Components	0C6D	0C12D	Description
AF002A	1	1	EVA 42U HP 10000 G2 Series Rack
252663-B21	2 (minimum)	2 (minimum)	component requirement specific
336881-B21	1	2	Can bus to Can bus cable
AD542B	6	12	M5314B FC Drive Enclosure
345580-B21	6	12	Cable Kit, Expansion Cab Drive Shelf

EVA3000/5000 Upgrade to 4Gb EVA	EVA4000/6000-A	EVA8000-A	SKUs Required
EVA4000/6000-A Controller Assembly Pair	Yes	N/A	AD525B
EVA8000-A Controller Assembly Pair	N/A	Yes	AD524B
EVA4000/6000-A FC loop Switches (kit contains 2 switches, mounting hardware and cables)	Yes*	N/A	AD557B
EVA8000-A FC loop Switches (kit includes 4 switches, mounting hardware and cables)	N/A	Yes*	AD553B
HP StorageWorks 4Gb Cable Kit (use with FC Loop Switches)	N/A	Yes*	AG311A
I/O Module A (1 per disk shelf enclosure)	Yes**	Yes**	AD623B
I/O Module B (1 per disk shelf enclosure)	Yes**	Yes**	AD624B
EMU	Yes**	Yes**	AD625B
HP StorageWorks EVA4000/6000/8000 v5.1 controller media kit (XCS V5.1)	Yes	Yes	T4256C
Command View EVA v5.0	Yes	Yes	****See URL
Command View Licenses	Check***	Check***	****See URL
Business Copy EVA v3.2	Yes	Yes	****See URL
Business Copy license	Yes	Yes	****See URL
Continuous Access EVA v2.3	Yes	Yes	****See URL
Continuous Access EVA license	Yes	Yes	****See URL
Replication Solutions Manager v2.0	Yes	Yes	****See URL
HP Services assessment and upgrade installation	Yes	Yes	*****See URL

Configuration Information and Configuration Rules

NOTES:
* If required for that configuration. Minimum switch revision 30-10010-03 required. For information on visual identification without removing the existing switch(s) see HP StorageWorks Enterprise Virtual Array User Guide. AG311A cable kit is required if the loop switch is upgraded.
**Check minimum revision I/O modules and EMUs...
Minimum...
EMU version 2
I/O Module Type: 2, version:2, FW:2.002
***Proper Command View licensing requires a License To Use (LTUs) equal to, or greater than the total raw capacity of each array and may be purchased in additive increments of 1Tb or Unlimited LTUs)
**** http://h18006.www1.hp.com/storage/software.html
***** http://www.hp.com/hps/storage/
NOTE: HP Services required when upgrading the EVA hardware.

EVA4000/6000/8000 Upgrade to 4Gb EVA	EVA4000/6000-A	EVA8000-A	SKUs Required
EVA4000/6000-A Controller Assembly Pair	Yes	N/A	AD525B
EVA8000-A Controller Assembly Pair	N/A	Yes	AD524B
EVA4000/6000-A FC loop Switches (kit contains 2 switches, mounting hardware and cables)	Yes*	N/A	AD557B
EVA8000-A FC loop Switches (kit includes 4 switches, mounting hardware and cables)	N/A	Yes*	AD553B
HP StorageWorks 4Gb Cable Kit (use with FC Loop Switches)	Yes*	Yes*	AG311A
I/O Modules	No	No	
EMU	No	No	
HP StorageWorks EVA4000/6000/8000 v5.1 controller media kit (XCS V5.1)	Yes if not at that version	Yes if not at that version	
Online upgrade-- see HP services for configuration requirements	Yes	Yes	
Command View EVA v5.0	Yes	Yes	****See URL
Command View Licenses	Check***	Check***	****See URL
Business Copy EVA v3.2	Yes	Yes	****See URL
Business Copy license	No	No	****See URL
Continuous Access EVA v2.3	Yes	Yes	****See URL
Continuous Access EVA license	No	No	****See URL
Replication Solutions Manager v2.0	Yes	Yes	****See URL
HP Services assessment and upgrade installation	Yes	Yes	*****See URL

NOTES:
* If required for that configuration. Minimum switch revision 30-10010-03 required. For information on visual identification without removing the existing switch(s) see HP StorageWorks Enterprise Virtual Array User Guide. AG311A cable kit is required if the loop switch is upgraded.
***Proper Command View licensing requires a License To Use (LTUs) equal to, or greater than the total raw capacity of each array and may be purchased in additive increments of 1Tb or Unlimited LTUs)
**** http://h18006.www1.hp.com/storage/software.html
***** http://www.hp.com/hps/storage/
NOTE: HP Services required when upgrading the EVA hardware.

Step 9 - Optional Components and Software

Replication Management

HP Business Copy EVA and HP Continuous Access comes complete with HP Replication Solutions Manager, a graphical user interface and scripting environment, that greatly simplifies storage management by creating, running, and managing storage replication jobs using controller based snapshots, clones and remote mirroring.

With HP Replication Solutions Manager users easily can manage both remote and local replication across the full EVA product family. By virtually removing the complexity associated with both small and large replication environments, point-in-time copies and remote replication are managed and configured with just a few mouse clicks. To assist the user, Information on the replication environment is presented in a variety of views, including an interactive topology manager that allows each user to select their viewing preference. In addition, HP Replication Solutions manager provides a scripting interface for additional flexibility.

Application Integration with Oracle

As an option to HP Business Copy EVA, the user can simply replicate an Oracle database. HP Replication Solutions Manager will provide a graphical interface to view the components of the database to be replicated, and allow selection of a specified database. The replication manager will automatically suspend the Oracle application, and take a point in time copy (local or remote) of all associated array virtual disks. The replication manager will provide the option to restart the original Oracle database after the replicas have been initiated on the array. The user will be able to utilize the replication manager to present the replica to another host.

Remote Replication Software

HP StorageWorks Continuous Access EVA is a controller-based application that performs real-time replication between HP StorageWorks enterprise virtual arrays. The solution is enhanced to perform remote replication, and deliver high data availability and performance to users on Fibre Channel based campus, metro or continental metro or continental Storage Area Networks (SANs).

Continuous Access EVA provides customers with the highest level of storage data protection capabilities to meet their business continuity implementation goals. Customers can achieve a competitive advantage by combining disaster-tolerant solutions and disaster-tolerant managed services into their planning and daily routines, ensuring the data's security, availability and integrity.

Continuous Access EVA delivers local copy with Snapshot XCS Controller Software and virtualization interoperability protect against disaster like scenarios, saving time and money while maintaining the flow of information across the enterprise. Continuous Access EVA is an irreplaceable component for protecting any business, yours especially.

Continuous Access EVA is sold by utilized capacity. Please see the product URL for ordering information and part numbers: http://h18006.www1.hp.com/storage/software.html

Local Replication Software

HP StorageWorks Business Copy EVA is a local replication software product for the EVA4000 array providing Snapshot and clone set-up and management. Business Copy EVA creates point-in-time copies of storage volumes, called Business Continuance Volumes (BCVs) using the snapshot and cloning capabilities of the array firmware and provides multi-array local mirror management. Additional features of the new product include licensing based on replicated (not total raw) capacity and a new improved management interface.

Business Copy EVA is sold by utilized capacity. See the product URL for ordering information and part numbers: http://h18000.www1.hp.com/storage/software.html

Optional Hardware Accessories

StorageWorks FC Drives - Upgrade installation	300 GB 10K rpm dual-port 2 Gb FC-AL 1-inch (2.54 cm) drive	364622-B22
	146 GB 10K rpm dual-port 2 Gb FC-AL 1-inch (2.54 cm) drive	293556-B22
	72 GB 10K rpm dual-port 2 Gb FC-AL 1-inch (2.54 cm) drive	238921-B22
	146 GB 15K rpm dual-port 2 Gb FC-AL 1-inch (2.54 cm) drive	364621-B22
	72 GB 15K rpm dual-port 2 Gb FC-AL 1-inch (2.54 cm) drive	293568-B22
	NOTE: These drives are for on-site install only. For Factory integration of drives see Step 3.	
HP StorageWorks FATA Drives - Upgrade installation	250 GB FATA disk dual-port 2Gb/s FC Hybrid disk drive upgrade	364437-B22
	400 GB FATA disk dual-port 2Gb FC Hybrid disk drive upgrade	382241-B22
	500 GB FATA disk dual-port 2Gb FC Hybrid disk drive upgrade	370790-B22
	NOTE: These drives are for on-site install only. For Factory integration of drives see Step 3.	
Non-HP Rack installation	For racks other than those specifically stated within the EVA4000/6000 product set, please visit the EVA web page for details on rack and power specifications: http://www.hp.com/go/eva	

SAN Components

The HP StorageWorks SAN integrates best-in-class storage networking components to deliver a complete connectivity platform for end-to-end network storage solutions. HP's fabric portfolio includes: HBA's, directors, switches, SAN extenders, NAS heads, iSCSI routers, and fabric software. HP SAN Infrastructure components deliver the network storage infrastructure for the Adaptive Enterprise. For details on SAN infrastructure components and storage compatibility information , please visit: http://hp.com/go/san

	EVA4000	EVA6000	EVA8000
Controller Model	HSV200	HSV200	HSV210
Controller Cache	2 GB per controller standard	2 GB per controller standard	4 GB per controller standard
Battery Backup for Cache	Yes, up to 96 hours	Yes, up to 96 hours	Yes, up to 96 hours
Virtual Controller Software (VCS)	HP StorageWorks EVA4000/6000/8000 v5.1 controller media kit	HP StorageWorks EVA4000/6000/8000 v5.1 controller media kit	HP StorageWorks EVA4000/6000/8000 v5.1 controller media kit
Host Interface	Fibre Channel Switched Fabric	Fibre Channel Switched Fabric	Fibre Channel Switched Fabric
Host Ports per Controller	Dual 4 Gb/s FC enabled (running at 2 or 4 Gb/s with 2 or 4 Gb/s switches and HBAs)	Dual 4 Gb/s FC enabled (running at 2 or 4 Gb/s with 2 or 4 Gb/s switches and HBAs)	Four 4 Gb/s FC enabled (running at 2 or 4 Gb/s with 2 or 4 Gb/s switches and HBAs)
Drive Interface	Two 2 Gb/s FC-AL ports per controller in redundant pairs, two paths to each dual ported HDD	Two 2 Gb/s FC-AL ports per controller in redundant pairs, two paths to each dual ported HDD	Four 2 Gb/s FC-AL ports per controller in redundant pairs, two paths to each dual ported HDD
RAID Levels	Vraid0, Vraid1, Vraid5 & Cross Vraid Snaps	Vraid0, Vraid1, Vraid5 & Cross Vraid Snaps	Vraid0, Vraid1, Vraid5 & Cross Vraid Snaps
Maximum Disks Supported	56 per Controller Pair	112 per Controller Pair	240 per Controller Pair (168 in one cabinet, expandable to 240 with an optional expansion cabinet.)
JBOD Support (behind XP)	Yes	Yes	Yes
Fibre Channel Switches & Directors	Optical Switches and Directors: http://h18006.www1.hp.com/storage/saninfrastructure/switches.html		
O/S Support	HP-UX HP OpenVMS HP Tru64 UNIX Windows 2000 Server & Advanced Server Windows 2003 Standard/Enterprise (32/64-bit) and Extended/DataCenter (64-bit) Sun Solaris Linux IBM AIX Novell NetWare VMware NOTE: See Operating System, Cluster and High Availability Compatibility matrix above for Operating System version detail.		
Sustained I/O and MB Throughput	Up to 141K IOPS and up to 335 MB/s throughput per Controller Pair	Up to 141K IOPS and up to 650 MB/s throughput per Controller Pair with two FC loop switches	Greater than 200,000 IOPs and over 1500 MB/s throughput per controller pair with four FC loops switches
Redundant Blowers	Yes	Yes	Yes
Environmental Monitoring Unit	Yes. Monitors Power and Temperature	Yes. Monitors Power and Temperature	Yes. Monitors Power and Temperature
Regulatory approvals	UL, CSA, TUV, FCC, CE MARK, CTICK, BSMI, VCCI	UL, CSA, TUV, FCC, CE MARK, CTICK, BSMI, VCCI	UL, CSA, TUV, FCC, CE MARK, CTICK, BSMI, VCCI
Management Software	Command View EVA v5.0 used with the Storage Management Appliance software v2.1 running on the HP OpenView Storage Management Appliance (SMA) or with a server in the SAN running Microsoft Windows.		
Disk Drives, Interface	Dual-port 2 Gb/s FC-AL	Dual-port 2 Gb/s FC-AL	Dual-port 2 Gb/s FC-AL

	EVA4000	EVA6000	EVA8000
Operating Temperature	50° to 95° F (10° to 35° C) - Reduce rating by 1° F for each 1000 ft altitude (1.8° C/1,000 m)		
Shipping Temperature	-40° to 150° F (-40° to 66° C)		
Humidity	10% to 90% non-condensing		
Shipping Humidity	5% to 90% non-condensing		
Altitude	Up to 8,000 ft (2,400 m)		
Air Quality	Not to exceed 500,000 particles per cubic foot of air at a size of 0.5 micron or larger		

Power Data maximum configuration

	EVA4000	EVA6000	EVA8000
AC plug type (quantity 2)	3 wire NEMA No. L6-30R, 30 amp (208 to 240V 60Hz 30A)		
Number of phases	Single		
Rated current	17A @ 200V-240V AC, 60Hz total, 4.25 A per power cord		
Nominal Line Voltage	208 or 230V		
Range Line Voltage	187 to 256V		
Line Frequency	60Hz		

Enterprise Virtual Array 4000

NOTE: This data represents fully populated drive shelves with 10K rpm disk drives. Other drive types may vary slightly.		208 Volts			230 Volts				
		2C1D	2C2D	2C3D	2C4D	2C1D	2C2D	2C3D	2C4D
Typical	Total System Wattage	507	883	1260	1637	507	883	1260	1637
	Total System BTU/hour	1729	3014	4300	5585	1729	3014	4300	5585
	Input Current (A) - Typical per system	2.5	4.4	6.3	8.2	2.3	4.0	5.7	7.4
	In Rush Current (A)	98	132	170	220	104	147	190	244
Failover Mode	Input Current (A) - Maximum per system	2.0	3.3	4.6	5.9	1.9	3.1	4.3	5.4
NOTE: Typical is described as a system in normal steady state operation. (I.e., both PDUs operating normally, the array reading/writing to disk drives in a production environment)									

Enterprise Virtual Array 6000

Technical Specifications

NOTE: This data represents fully populated drive shelves with 10K rpm disk drives. Other drive types may vary slightly.		208 Volts					230 Volts				
		2C4D	2C5D	2C6D	2C7D	2C8D	2C4D	2C5D	2C6D	2C7D	2C8D
Typical*	Total System Wattage	1707	2084	2460	2837	3214	1707	2084	2460	2837	3214
	Total System BTU/hour	5824	7109	8395	9680	10965	5824	7109	8395	9680	10965
	Input Current (A) - Typical per system	8.5	10.4	12.3	14.1	16.0	7.7	9.4	11.1	12.8	14.5
	In Rush Current (A)	220	250	280	321	363	244	272	311	357	403
Failover Mode	Input Current (A) - Maximum per system	5.9	7.1	8.3	9.5	10.8	5.4	6.5	7.5	8.5	9.5
*NOTE: Typical is described as a system in normal steady state operation. (I.e., both PDUs operating normally, the array reading/writing to disk drives in a production environment)											

Enterprise Virtual Array 8000

NOTE: This data represents fully populated drive shelves with 10K rpm disk drives. Other drive types may vary slightly.		208 Volts					230 Volts				
		2C2D	2C6D	2C8D	2C10D	2C12D	2C2D	2C6D	2C8D	2C10D	2C12D
Typical*	Total System Wattage	1023	2530	3284	4037	4920	1023	2530	3284	4037	4920
	Total System BTU/hour	3492	8633	11204	13775	16789	3492	8633	11204	13775	16789
	Input Current (A) - Typical per system	5.1	12.6	16.4	20.1	24.5	4.6	11.4	14.8	18.2	21.6
	In Rush Current (A)	132	280	363	451	528	147	311	403	500	586
Failover Mode	Input Current (A) - Maximum per system	3.3	8.3	10.8	13.1	15.5	3.1	7.5	9.5	12.1	14.0
This data represents fully populated drive shelves with 10K rpm disk drives. Other drive types may vary slightly. *NOTE: Typical is described as a system in normal steady state operation. (I.e., both PDUs operating normally, the array reading/writing to disk drives in a production environment.)											

Enterprise Virtual Array 4000/6000/8000 Product Dimensions, Weight and Clearance

Physical Dimensions	Height in/cm	Width in/cm	Depth in/cm	Max Weight lb/kg	Req. Front Clearance in/cm	Req. Rear Clearance in/cm
EVA4000/8000 2C2D (42U Graphite cab)	78.75 (200.03)	23.7 (60.3)	40.2 (102.2)	537 (244.1)	30 (76.2)	30 (76.2)
EVA6000/8000 2C6D (42U Graphite cab)	78.75 (200.03)	23.7 (60.3)	40.2 (102.2)	854 (308.2)	30 (76.2)	
EVA8000 2C12D (42U Graphite cab)	78.75 (200.03)	23.7 (60.3)	40.2 (102.2)	1290 (586.4)	30 (76.2)	30 (76.2)
EVA4000/6000/8000 Controller Assembly	7.0/17.78	17.6/44.70	27.5/69.85	120/54.55	N/A	N/A
M5314B Drive Enclosure	5.25/13.34	19.0/42.26	20/50.8	71/32.21	N/A	N/A